

# PKISFEPIPIHYCAPAGFAI

## QUERY

## PKISFEPIPIHYCAPAGFAI

CONSENSUS\_A --V-----  
 A.GB.MA246 --V-----Y--  
 A.GB.MC108 --V-----  
 A.KE.K89 --VT-----  
 A.KE.Q23-CXC-CG --V-----T-----  
 A.NG.NG1935 --V-----  
 A.RW.KIG93 --V-----  
 A.RW.SF1703 --V-----  
 A.SE.SE6594 --VT-----  
 A.SE.SE7253 --V-----  
 A.SE.SE7535 --VT-----  
 A.SE.SE8131 --V-----  
 A.SE.SE8538 --VT-----  
 A.SE.SE8891 --V-----  
 A.UG.92UG037 --VT-----Y--  
 A.UG.U455 --V-----  
 A.UG.UG273A --V-----  
 A.UG.UG275A --V-----  
  
 CONSENSUS\_B --v-----  
 B.AU.MBC18 -----  
 B.AU.MBC200 --V-----  
 B.AU.MBC925 --V-----Y-----  
 B.AU.MBCC54 --V-----  
 B.AU.MBCC98 ---S-----L  
 B.AU.MBCD36 -----  
 B.BE.SIMI84 --V-----T-----  
 B.CN.RL42 --V-----T-----  
 B.DE.D31 --V-----T-----M  
 B.DE.HAN --V-----  
 B.ES.89SP061 --V-----  
 B.FR.HXB2 --V-----  
 B.FR.PHI120 --V-----Y--  
 B.FR.PHI133 --V-----  
 B.FR.PHI146 --V-----  
 B.FR.PHI153 --VT-----T-----  
 B.FR.PHI159 -----  
 B.FR.PIH155 --V-----  
 B.FR.PIH160 --V-----F-----  
 B.FR.PIH309 --VT-----  
 B.FR.PIH373 -----  
 B.FR.PIH374 --VT-----  
 B.GA.OYI -----M---T-----  
 B.GB.AC-46 -QVT-----  
 B.GB.CAM1 --V-----T-----  
 B.GB.GB8.C1 -----F-----  
 B.GB.JB -Q--V-----  
 B.GB.M23470 --V-----T-----L  
 B.GB.M26864 --V-----F-----  
 B.GB.M30156 --T-----  
 B.GB.M737677 --V-----P-----  
 B.GB.M737685 --V-----  
 B.GB.MANC --V-----T-----  
 B.GB.MB314 --VT-----

B.GB.WB --V-----L-----  
 B.JP.ETR --V-----T-----L  
 B.JP.JH32 -----  
 B.NL.3202A21 --V-----F-T-----L  
 B.NL.68A --V-----  
 B.NL.ENVVA -----M  
 B.NL.ENVVF --V-----F-----T-  
 B.NL.ENVVG --V-----F-T-----L  
 B.NL.H0320-2A12 --V-----T-----T-  
 B.TH.TH936705 --V-----T-----  
 B.TT.QZ4589 --V-----T-----  
 B.TW.LM49 --V-----T-----  
 B.US.85WCIPR54 --V-----  
 B.US.92US657.1 --VT-----  
 B.US.ADA --V-----T-----  
 B.US.ALA1 --V-Q-----  
 B.US.BC -----  
 B.US.BRVA --VT-----  
 B.US.C26-12.1BH --VT-----  
 B.US.CDC452 --V-----T-T---L  
 B.US.DH123 --V-----  
 B.US.ENVUS-R2 -----  
 B.US.JRCSF --V-----  
 B.US.JRFL -----  
 B.US.M02-3.SW --VT-----  
 B.US.MNCG -----  
 B.US.NC7 --V-----  
 B.US.NL43E9 --VT-----  
 B.US.NY5CG --V-----  
 B.US.P896 --V-Q-----V---M  
 B.US.RF --V-----T-----  
 B.US.SC --V-----R.W---  
 B.US.SC141 --V-K-----T---L  
 B.US.SC14C --V-----T-----L  
 B.US.SF128A --V-----T-----  
 B.US.SF2 --V-----T-----  
 B.US.SFMHS1 -----T-----  
 B.US.SFMHS11 --V-----L--  
 B.US.SFMHS16 --VT-----T-----  
 B.US.SFMHS17 -----  
 B.US.SFMHS18 --VT-----  
 B.US.SFMHS19 -----  
 B.US.SFMHS2 --V-----  
 B.US.SFMHS20 --V-----  
 B.US.SFMHS21 --V-----  
 B.US.SFMHS3 --V-----T-----  
 B.US.SFMHS4 --V-Y-----  
 B.US.SFMHS5 --V-----F-----  
 B.US.SFMHS6 --V-Q-----  
 B.US.SFMHS7 --V-----  
 B.US.SFMHS8 --V-----  
 B.US.SFMHS9 --V-----T-----  
 B.US.US1 --V-----G-  
 B.US.US2 --VT-----  
 B.US.US3 --V-----T-----  
 B.US.US4 --V-----  
 B.US.WC001 --V-----  
 B.US.WEAU160 --V-----

B.US.WMJ22 --V-----  
 B.US.WR27 --V-----T-----  
 B.US.YU2 --V-----  
  
 CONSENSUS\_C --V-d-----Y--  
 C.BI.BU910112 --V-D-----Y--  
 C.BI.BU910213 --V-D-----Y--  
 C.BI.BU910316 --V-N-----Y--  
 C.BI.BU910423 --V-D-----Y--  
 C.BI.BU910518 --V-----Y--  
 C.BI.BU910611 --V-D---L-----Y--  
 C.BI.BU910717 --V-D-----Y--  
 C.BI.BU910812 --V-D-----Y--  
 C.BR.92BR025 --V-D-----Y--  
 C.BW.96BW01B03 --V-D-----T-----  
 C.BW.96BW0402 --VT-D-----Y--  
 C.BW.96BW0502 --V-D-----T---Y--  
 C.BW.96BW11B01 --V-D-----Y--  
 C.BW.96BW1210 --V-D-----Y--  
 C.BW.96BW15B03 --V-D-----Y--  
 C.BW.96BW16B01 --VT-D-----Y--  
 C.BW.96BW17B05 --V-D-----Y--  
 C.DJ.DJ259A --V-LD-----Y--  
 C.DJ.DJ373A --V-----Y--  
 C.ET.ETH2220 --V-LD-----Y--  
 C.IN.21068 --VT-D-----Y--  
 C.IN.301904 --VT-D-----T---Y--  
 C.IN.301905 --VT-D-----T---Y--  
 C.IN.301999 --VT-D-----T---Y--  
 C.IN.94IN11246 --V-D-----T---Y--  
 C.SN.SE364A --V-LD-----Y--  
 C.SO.SM145A --V-D-----Y--  
 C.UG.UG268A2 --VTLD-----Y--  
  
 CONSENSUS\_D --vt-----  
 D.CD.84ZR085 --V-----  
 D.CD.ELI --V-----  
 D.CD.JY1 --VT-----  
 D.CD.NDK -----F-----  
 D.CD.Z2Z6 --V-----  
 D.SN.SE365A2 --V-----  
 D.TZ.87T24622 --T-----  
 D.UG.92UG024D --VT-----  
 D.UG.94UG1141 --MT-----  
 D.UG.C971-412 --V-----  
 D.UG.UG266A2 --VT-----  
 D.UG.UG269A --T-----  
 D.UG.UG274A2 --V-----Y--  
 D.UG.WHO15-474 --VT-----  
 F.BR.BZ126A --V-WD-----Y--  
  
 CONSENSUS\_F1 --V-WD-----Y--  
 F1.BE.VI850 --V-WD-----Y--  
 F1.BR.93BR020.1 --V-WD-----Y--  
 F1.FI.FIN9363 --V-WD-----Y--  
 F1.FR.MP411 --V-WD-----Y--  
  
 CONSENSUS\_F2 --V-D-----?-

F2.CM.MP255	--V--D-----Y--	AGJ.NG.NG3670	--VT-G-----G--
F2.CM.MP257	--V--D-----	AGU.CD.Z321	--V-----
CONSENSUS_G	--Vt-d-----	AU.NG.NG3678	--V-----
G.BE.DRCBL	--VT-----	BF.BR.93BR029.4	--V-WD-----Y--
G.FI.HH8793	--VD-D-----G---	CD.BI.BU910905	--VT-----
G.GA.LBV217	--VT-D-----	CRF01_AE.CF.90CF402	--V--D-----Y--
G.NG.92NG083	--VN-D-----	CRF01_AE.TH.93TH253	--V--D-----T---Y--
G.NG.NG1928	--VT-----	CRF01_AE.TH.A01021.	-----D-----T---Y--
G.NG.NG1929	--VT-D-----	CRF01_AE.TH.070703	-----D-----T---Y--
G.NG.NG1937	--V--D-----	CRF01_AE.TH.070704	-----D-----T---Y--
G.NG.NG1939	--V--D-----	CRF01_AE.TH.070705	-----D-----T---Y--
G.SE.SE6165	--VT-D-----T---	CRF01_AE.TH.070707	-----D-----T---Y-L
CONSENSUS_H	--V-----	CRF01_AE.TH.070708	--V--D-----T---Y--
H.BE.VI991	--V-----	CRF01_AE.TH.070709	--VT-D-----T---YV-
H.BE.VI997	--V--D-----	CRF01_AE.TH.070710	-----D-----T---Y--
H.CF.90CF056	--V-----	CRF01_AE.TH.070711	--V--D-----T---Y--
CONSENSUS_J	--V--Q-----	CRF01_AE.TH.070713	-----D-----T---Y--
J.SE.SE9173	--V--Q-----	CRF01_AE.TH.CM240	-----D-----T---Y--
J.SE.SE9280	--V--Q-----	CRF01_AE.TH.E11429.	-----D-----T---Y--
CONSENSUS_K	--V?-----	CRF01_AE.TH.KH03	-----D-----T---Y--
K.CD.EQTB11C	--V-----	CRF01_AE.TH.KH08	--V--N-----T---YV-
K.CM.MP535	--VT-----	CRF01_AE.TH.TH022	--V--D-----T---Y--
N.CM.YBF30	--T-----P---	CRF01_AE.TH.TH047	-----D-----T---Y-M
CONSENSUS_O	--v-----y--	CRF01_AE.TH.TH92014	-----D-----T---Y--
O.CM.ANT70C	--V-----Y--	CRF01_AE.TH.TH92111	--V--D-----T---Y--
O.CM.CM4974	--V-----	CRF02_AG.DJ.DJ258A	--VT-----
O.CM.HIV1CA9EN	--V-----Y--	CRF02_AG.FR.DJ263	-RVTL-----L--
O.CM.MVP5180	--V-----T-Y--	CRF02_AG.FR.DJ264	--VT-----
O.GA.VI686	--V-----Y--	CRF02_AG.NG.IBNG	--V-----
O.GQ.193HA	--V-----Y--	CRF02_AG.NG.NG1921	--V-----F-----Y--
O.GQ.276HA	--V-----Y--	CRF02_AG.NG.NG3675	-----F-----
O.GQ.341HA	--V-----Y--	CRF03_AB.RU.KAL1532	---F-----
O.GQ.655HA	.....	CRF03_AB.RU.KAL681	--VT-----Y-----
AC.IN.21301	--VT-N-----T---Y--	CRF03_AB.UA.UKR9700	--V-----
AC.RW.92RW009	--V-----N---	CRF04_cpx.CY.94CY03	--V-----
AC.SE.SE9488	--V--D-----P---	CRF04_cpx.GR.97PVCH	--VTL--NSHTLLC-GW-CD
AC.ZM.ZAM174	--V-LD-----Y--	CRF04_cpx.GR.97PVMY	---K-----
AC.ZM.ZAM184	--V-----T---	DF.BE.VI961	--VCWD-----Y--
AC.ZM.ZAM716-3	--AN-D-----Y--	GH.GA.VI525	--V-----
ACD.SE.SE8603	--V-----	GU.NG.NG3670	--V-----
AD.KE.K124A2	--V-----	U.CD.VI1126	--V-----
AD.SE.SE6954	--VT-----	CONSENSUS_CPZ	--t-----
AD.SE.SE7108	--VT-----	CPZ.CD.CPZANT	E-ST-----Y--
AD.UG.C6080-10	--VT-----	CPZ.GA.CPZGAB	--T-----
AD.UG.UG/92/035	--VT-----T---Y--	CPZ.US.CPZUS	--T-----P---
ADHU.NO.NOGIL3	--VT-----		
ADU.CD.MAL	--VT-D-----		
AG.GA.VI191A2	--V-----		
AG.NG.G3	--V--D-L-----		
AG.SE.SE7812	--V-----		
AGHU.GA.VI354	--V--D-----		
AGJ.AU.BFP90	--V-----		
AGJ.ML.95ML84	--V-----		

**Study Subject ID:00RCH26**

**Study Subject Clone:**

**Study Subject HLA:A29,A33,B72,B49,Cw2,Cw7**

**Sequence: Known reactive 20Mer0: PKISFEPIPIHYCAPAGFAI gp160(206–225)**

**Possible HLA**

A29 A\*2901,A\*2902  
A33 A\*3301,A\*3303  
B49 B\*4901  
B72 B\*1503,B\*1546  
Cw2 Cw\*0202  
Cw7 Cw\*0701,Cw\*0702,Cw\*0704,Cw\*0706

**Possible Epitopes based on anchor residues**

(5-12) FEPIPIHY A\*2902  
(4-12) SFEPPIPIHY Cw\*0702  
(10-18) IHYCAPAGF Cw\*0702  
(5-12) FEPIPIHY Cw\*0702  
(11-18) HYCAPAGF Cw\*0702  
(3-12) ISFEPIPIHY Cw\*0702  
(9-18) PIHYCAPAGF Cw\*0702

**Anchor Residues Searched**

A\*2902 X[E]XXXXXX[Y]  
A\*2902 X[E]XXXXXX[Y]  
A\*2902 X[E]XXXXXXXX[Y]  
Cw\*0702 XXXXXXXXX[YFL]  
Cw\*0702 XXXXXXXXX[YFL]  
Cw\*0702 XXXXXXXXX[YFL]

**This table lists epitopes that are experimentally observed to be presented by a HLA type carried by the patient, but the defined epitope has substitutions relative to the peptides from your reference strains and so might be missed by your reagents: in HXB2 for Gag, Pol; MN for Env; BRU for Nef, relative to most B clade Sequences in the database:**

<b>Protein</b>	<b>Epitope in Database</b>	<b>Epitope in Ref. strain</b>	<b>Epitope in Consensus B</b>	<b>HLA</b>	<b>Notes</b>
gp160(208–217)	VSFEPIPIHY	ISFEPIPIHY	VSFEPIPIHY	A29	
gp160(376–384)	PNCGGGEFFY	FNCGGGEFFY	FNCGGGEFFY	A29	
gp160(419–427)	RIKQIINMW	KIKQIINMW	RIKQIINMW	A29,A32	
Nef(135–143)	YLPTFGWCY	YPLTFGWCY	YPLTFGWCF	B49	

Table 1: **gp160**

HXB2 Location	Author Location	Sequence	Immunogen	Species(HLA)	References
gp160(208–217)	gp120()	VSFEPPIHY	HIV-1 exposed seronegative	human(A29)	[Kaul (2000)]
					<ul style="list-style-type: none"> <li>• 11/16 heavily HIV exposed but persistently seronegative sex-workers in Nairobi had HIV-specific CD8 gamma-IFN responses in the cervix – systemic CD8+ T cell responses tended to be to the same epitopes but at generally lower levels than cervical CD8+ T cell responses</li> <li>• Low risk individuals did not have such CD8+ cells</li> <li>• CD8+ epitopes T cell DTVLEDINL (3 individuals), SLYNVATL (4 individuals), LSPRTLNAW (3 individuals) and YPLTFGWCF (4 individuals) were most commonly recognized by the HIV-resistant women</li> </ul>
gp160(376–384)	gp120(376–384 IIIB)	PNCRGGEFFY	HIV-1 infection	human(A29)	[Wilson (1999)]
					<ul style="list-style-type: none"> <li>• This study describes maternal CTL responses in the context of mother-to-infant transmission</li> <li>• Detection of CTL escape mutants in the mother was associated with transmission, but the CTL-susceptible forms of the virus tended to be found in infected infants</li> <li>• PNCRGGEFFY was an escape variant</li> </ul>
gp160(419–427)	gp120(419–427)	RIKQIINMW?	HIV-1 infection	human(A29,A32)	[Betts (2000)]
					<ul style="list-style-type: none"> <li>• Only 4/11 HLA-A2+ HIV+ individuals had CTL that reacted to SLYNTVATL, calling into question whether it is immunodominant</li> <li>• Ninety five optimally defined peptides from this database were used to screen for gamma interferon responses to other epitopes</li> <li>• 1/11 of the A2+ individuals was A29 and responded to RIKQIINMW, and another responder was A32 and these are thought to be presenting molecules</li> <li>• The sequence is unclear – Betts calls both peptide 30 and peptide 32 gp120 419–427 and the peptide sequences are not provided</li> </ul>

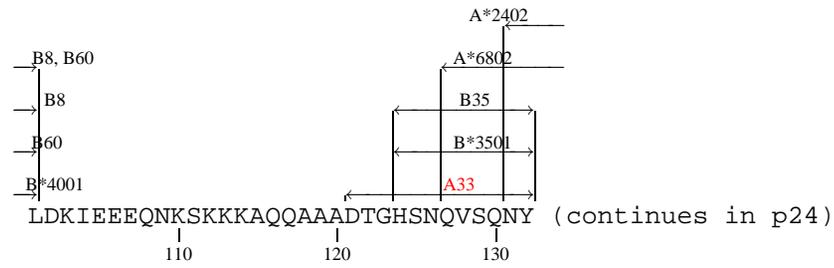
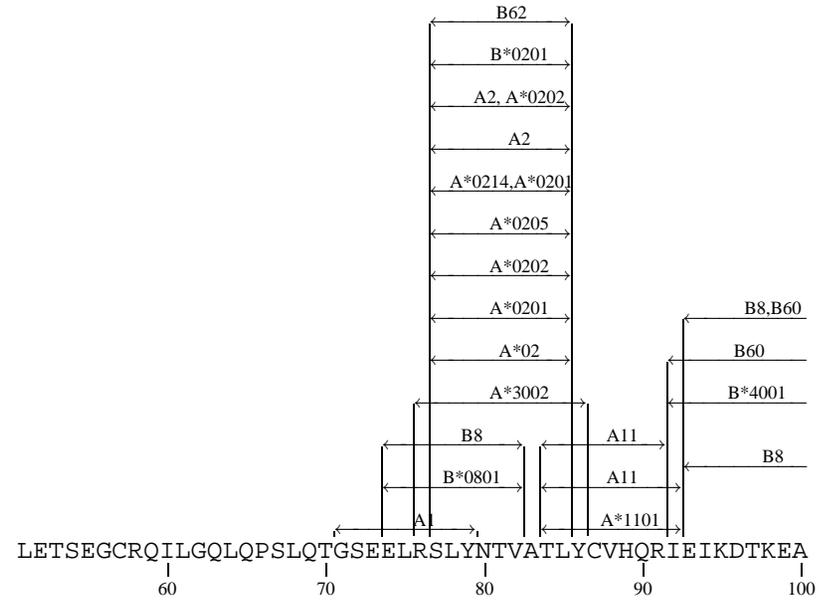
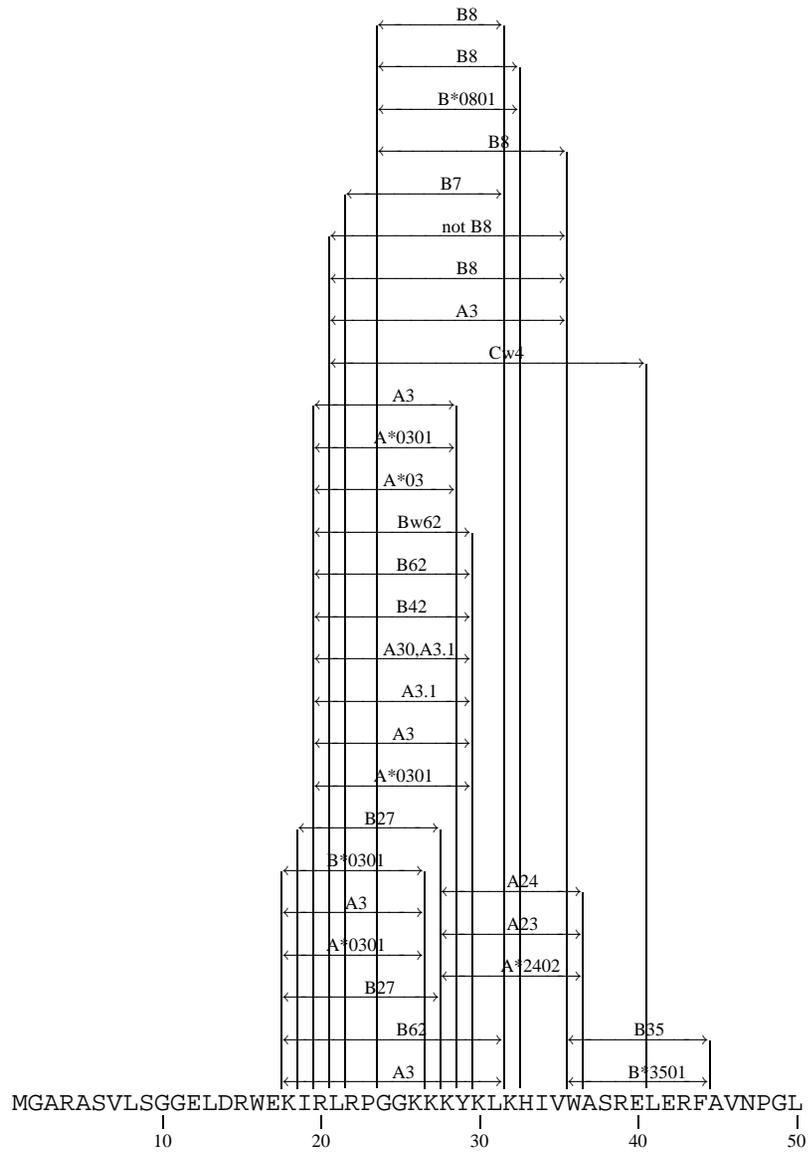
Table 2: **Nef**

HXB2 Location	Author Location	Sequence	Immunogen	Species(HLA)	References
Nef(135–143)	Nef()	YPLTFGWCF	HIV-1 exposure	human(B49)	[Rowland-Jones (1998)]
					<ul style="list-style-type: none"> <li>• HIV-specific CTL were found in exposed seronegative prostitutes from Nairobi – these CTL may confer protection</li> <li>• Seroprevalence in this cohort is 90-95% and their HIV-1 exposure is among the highest in the world</li> <li>• Most isolated HIV strains are clade A in Nairobi, although clades C and D are also found – B clade epitopes are often cross-reactive, however stronger responses are frequently observed using A or D clade versions of epitopes</li> <li>• This epitope is conserved among A and B clade viruses</li> <li>• The Clade D version of the epitope, YPLTFGWCF, was preferentially recognized by CTL</li> </ul>

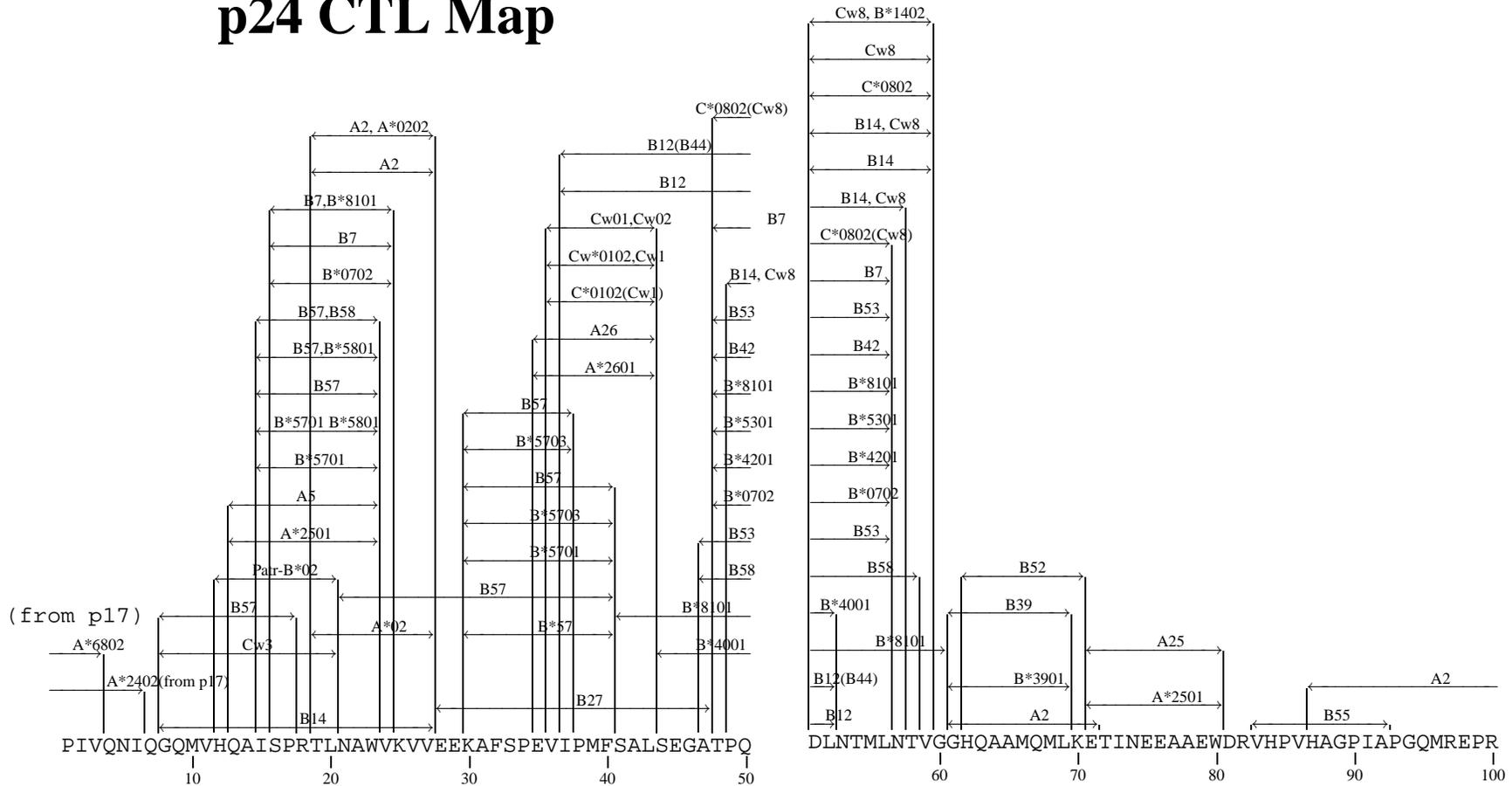
Table 3: **All Defined Epitopes within the 20mer, regardless of HLA type**

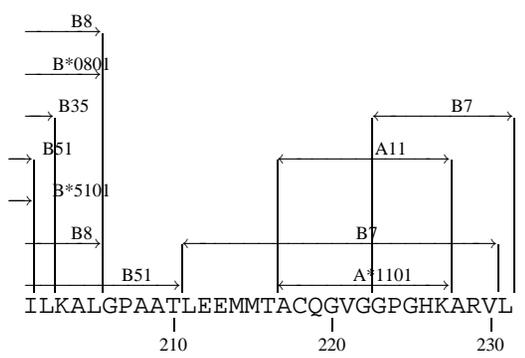
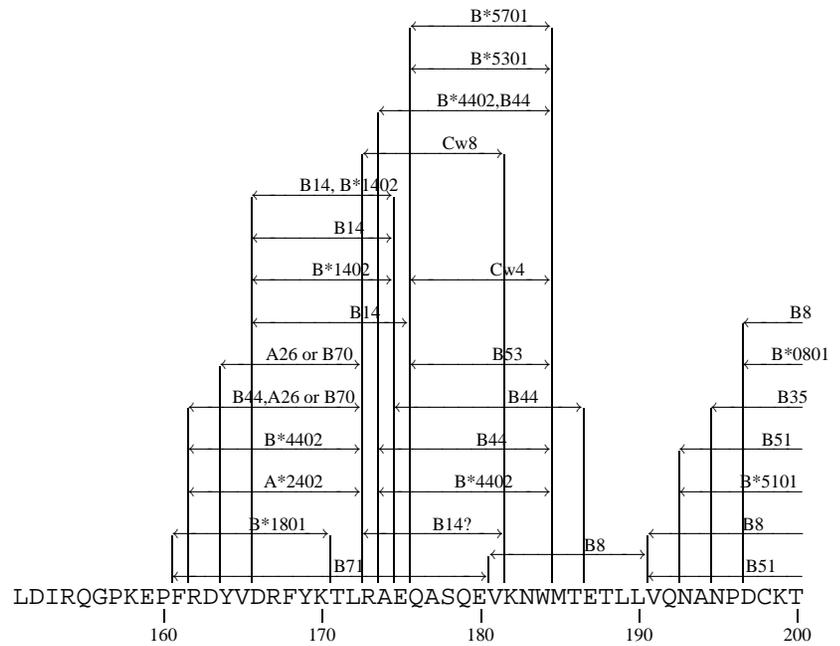
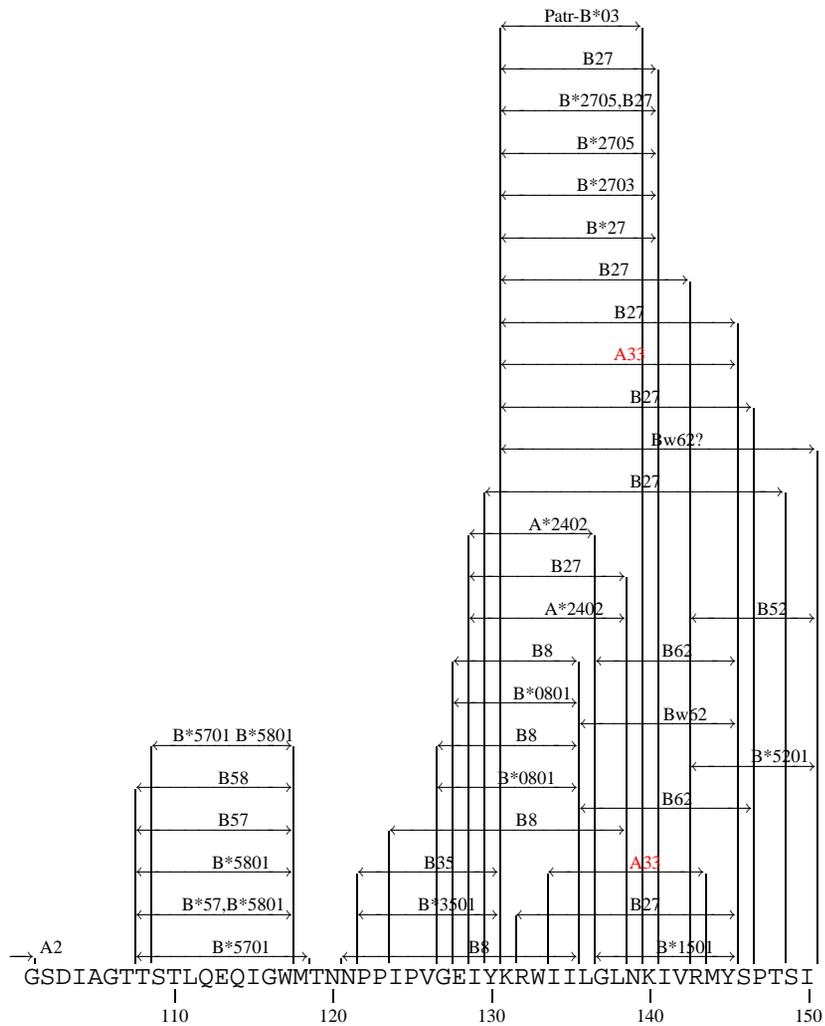
HXB2 Location	Author Location	Sequence	Immunogen	Species(HLA)	References
gp160(208–217)	gp120()	VSFEPPIHY	HIV-1 exposed seronegative	human(A29)	[Kaul (2000)]
					<ul style="list-style-type: none"> <li>• 11/16 heavily HIV exposed but persistently seronegative sex-workers in Nairobi had HIV-specific CD8 gamma-IFN responses in the cervix – systemic CD8+ T cell responses tended to be to the same epitopes but at generally lower levels than cervical CD8+ T cell responses</li> <li>• Low risk individuals did not have such CD8+ cells</li> <li>• CD8+ epitopes T cell DTVLEDINL (3 individuals), SLYNVATL (4 individuals), LSPRTLNAW (3 individuals) and YPLTFGWCF (4 individuals) were most commonly recognized by the HIV-resistant women</li> </ul>
gp160(209–217)	()	SFEPPIHY		(A29)	[Brander & Goulder(2001), Altfeld(2000)]

# p17 CTL Map

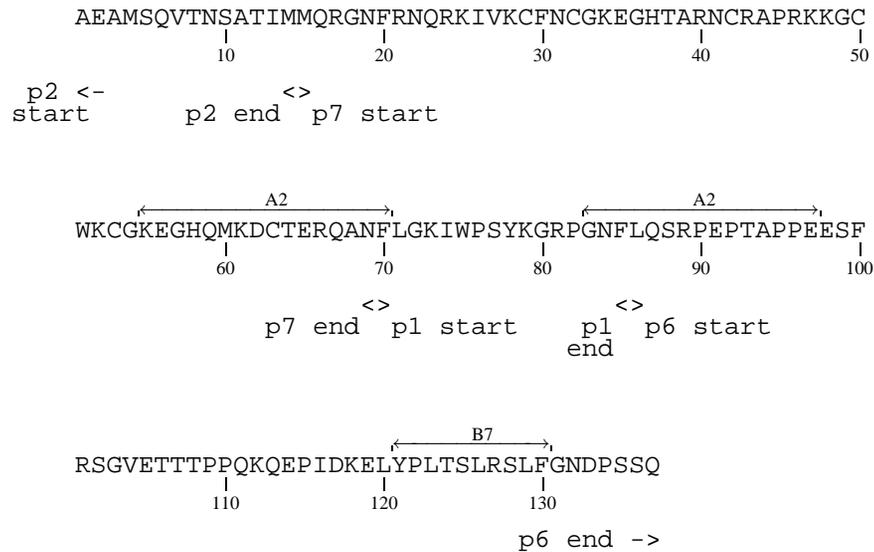


# p24 CTL Map

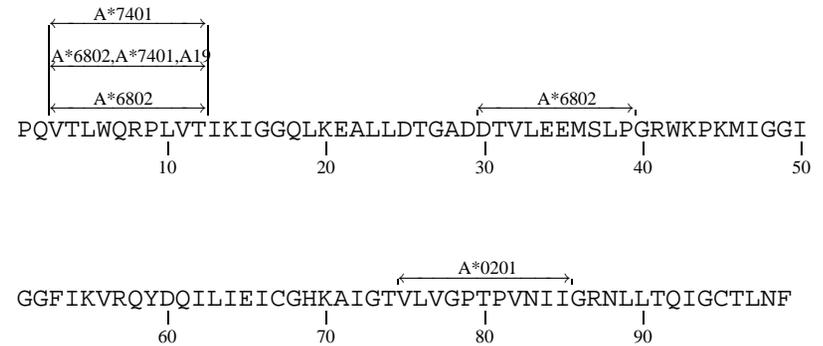




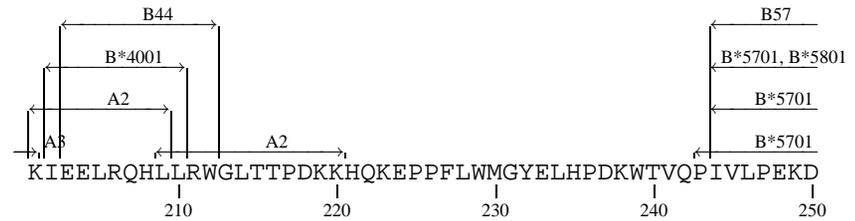
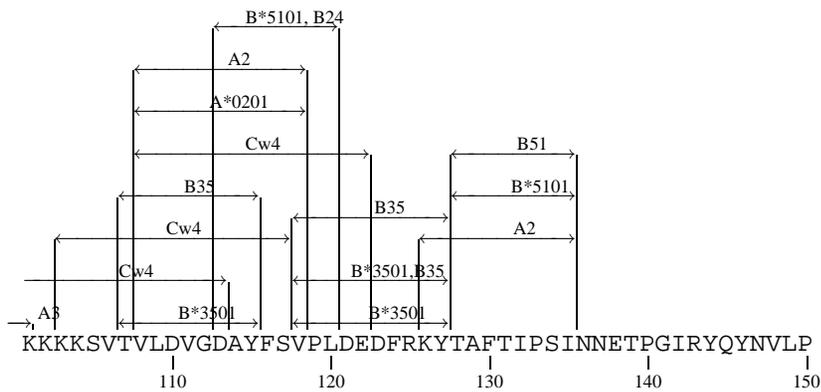
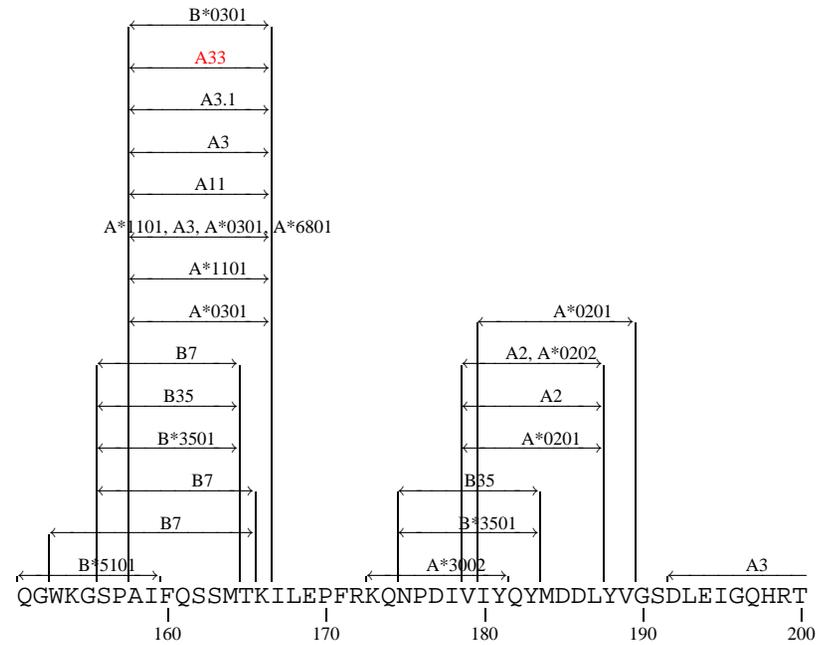
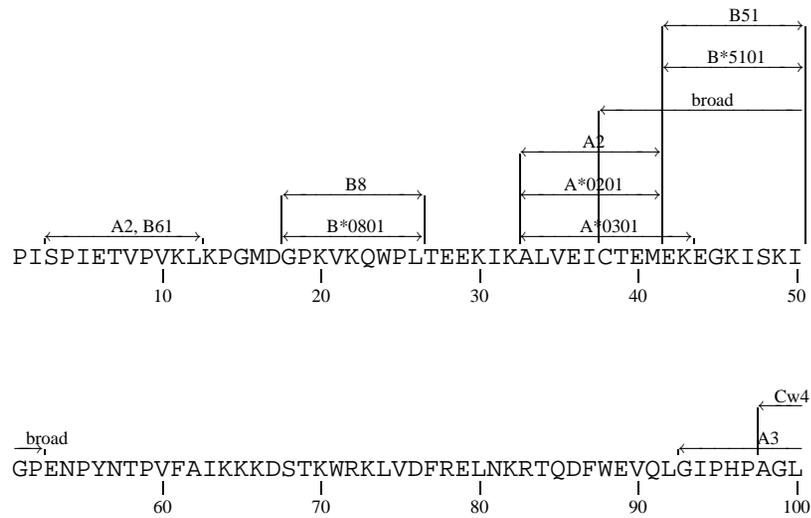
# p2p7p1p6 CTL Map

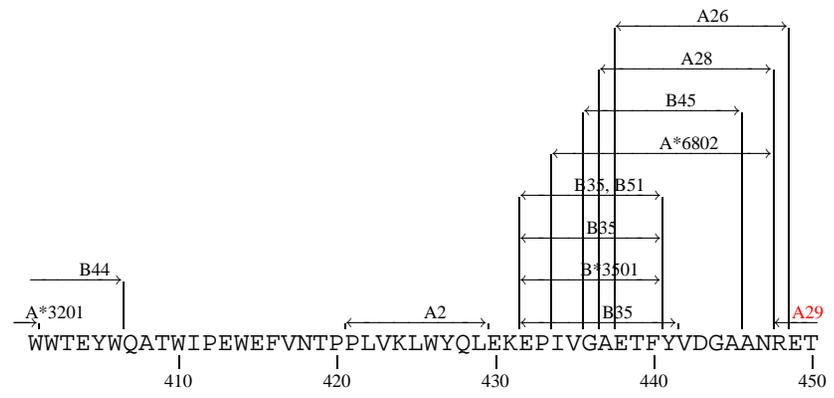
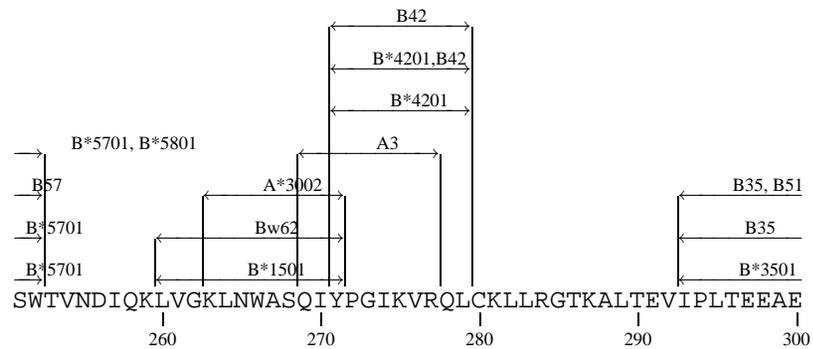


# Protease CTL Map

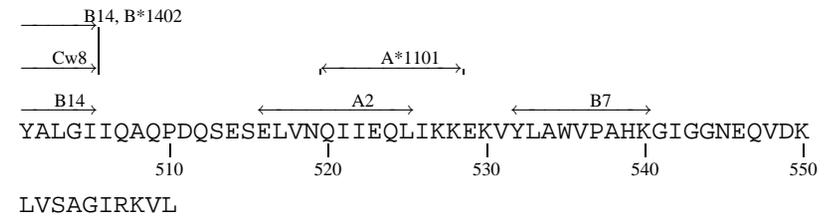
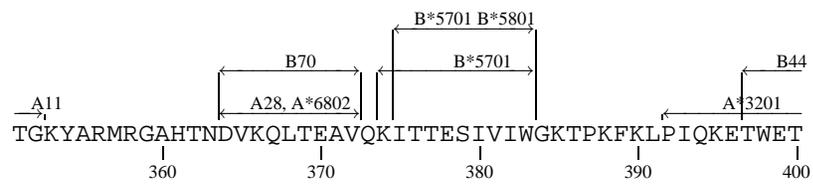
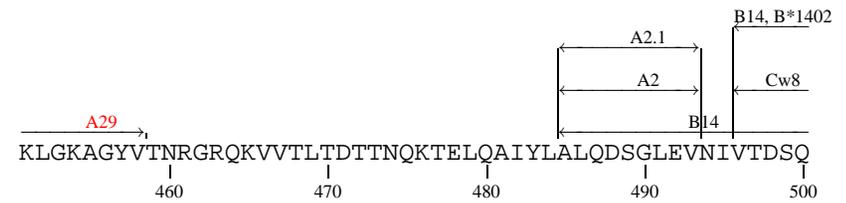


# RT CTL Map



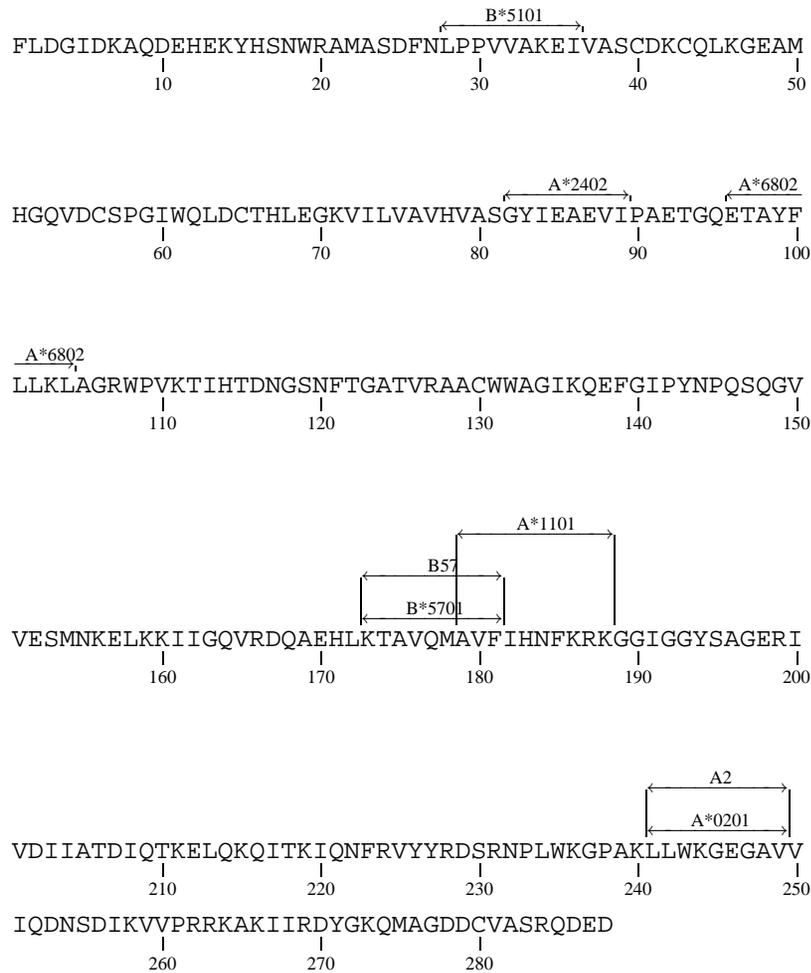


p15 RNase start <-

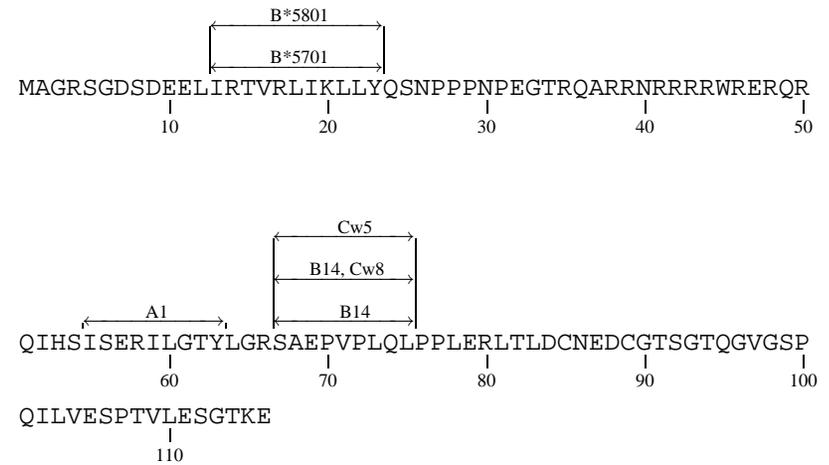


-> p15 RNase end

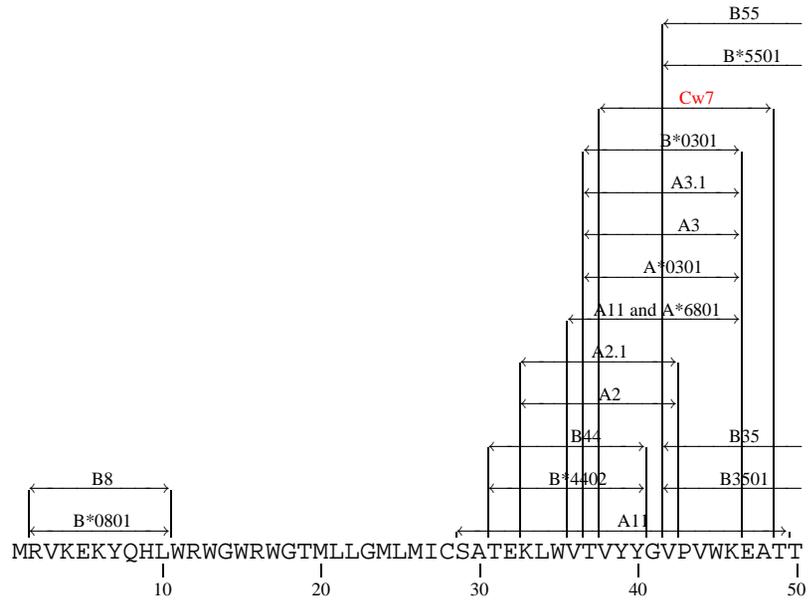
# Integrase CTL Map



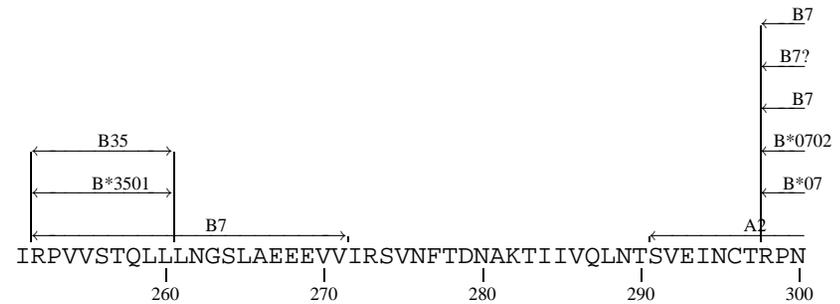
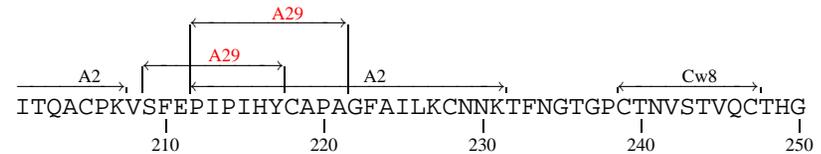
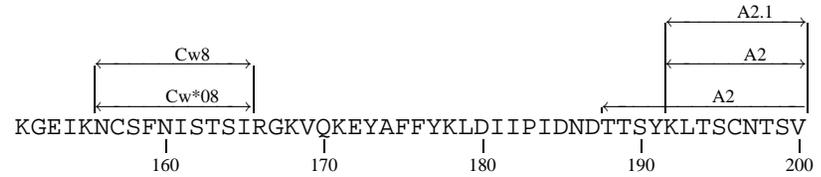
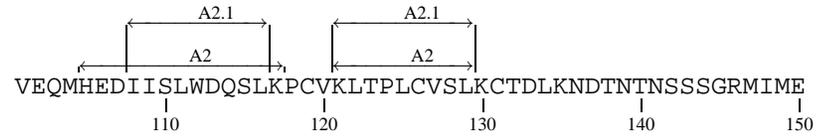
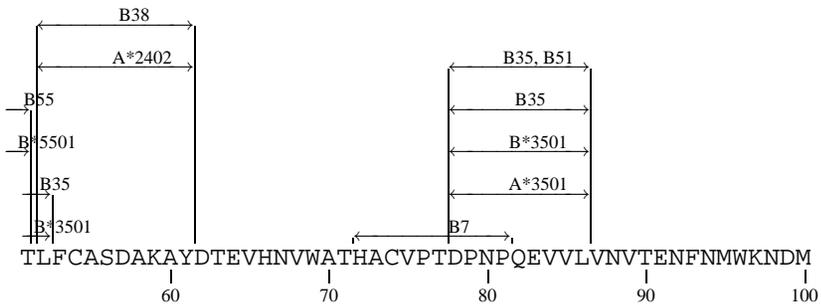
# Rev CTL Map

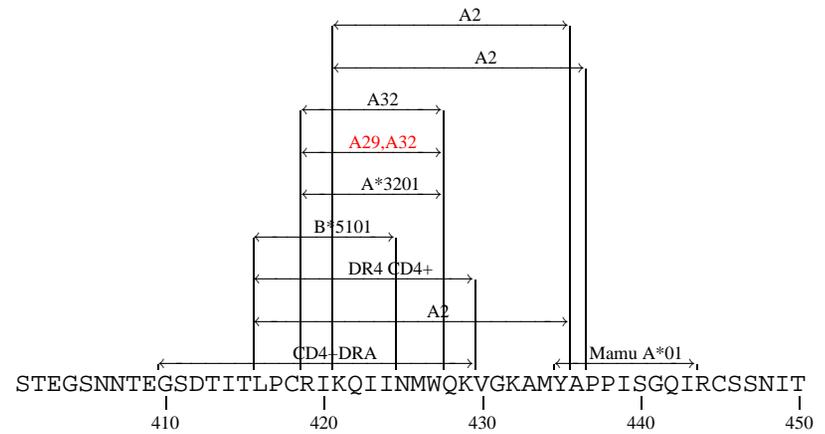
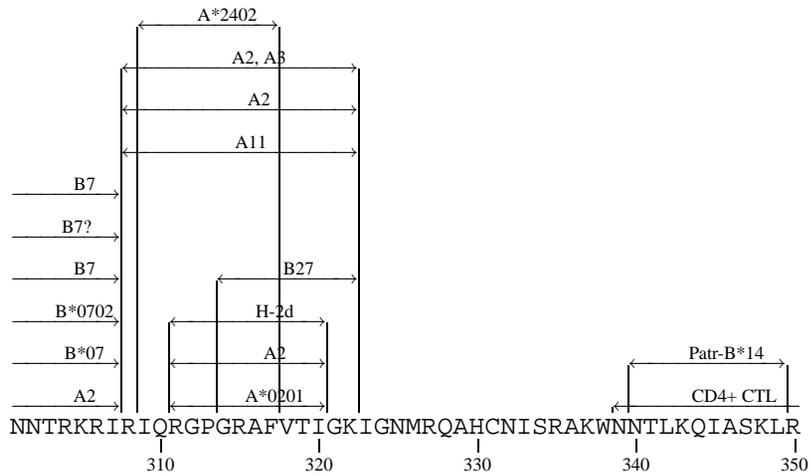


# gp160 CTL Map

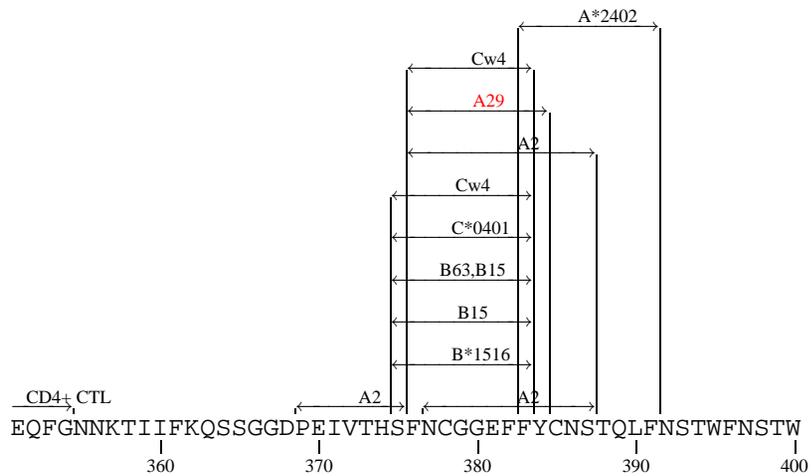


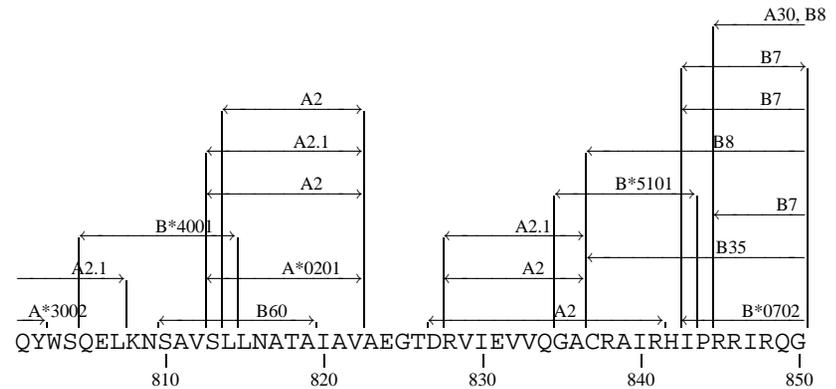
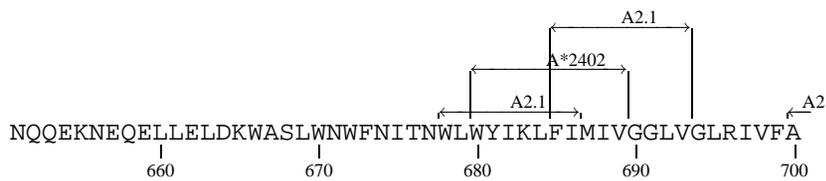
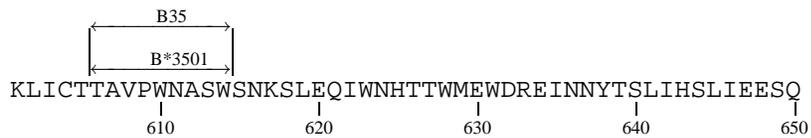
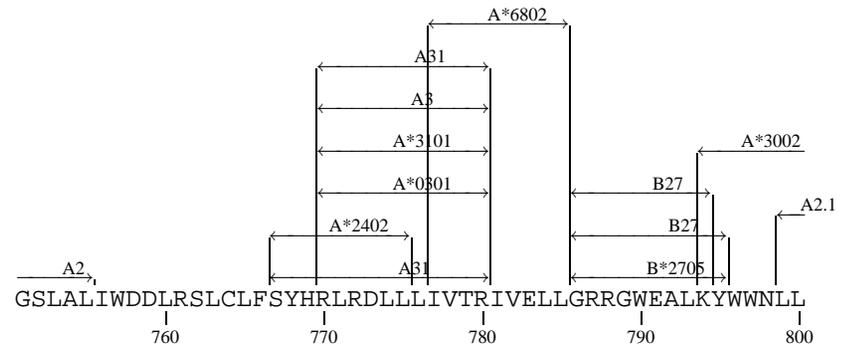
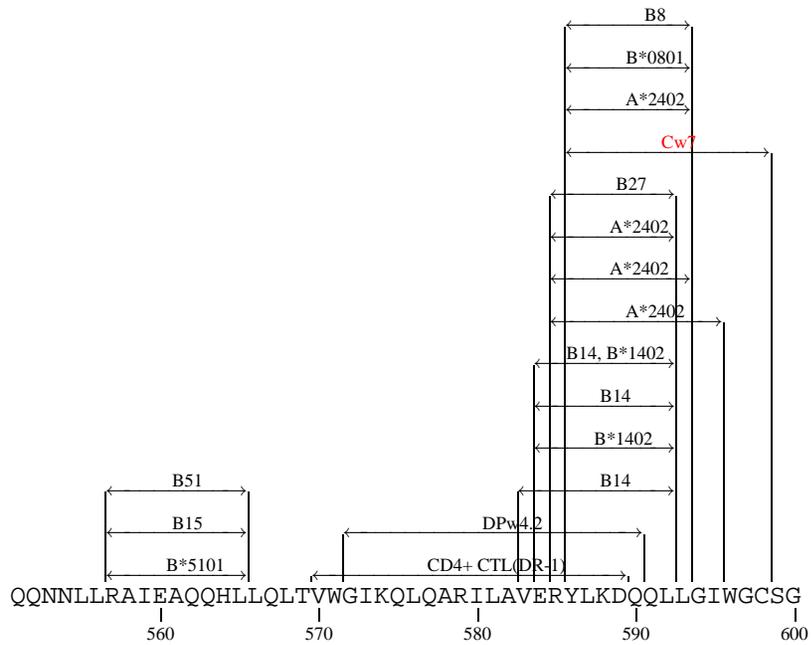
<- gp120 start



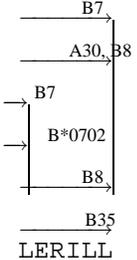


gp120 end <> gp41 start

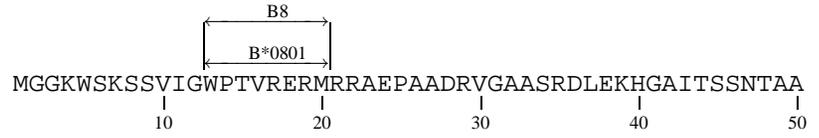


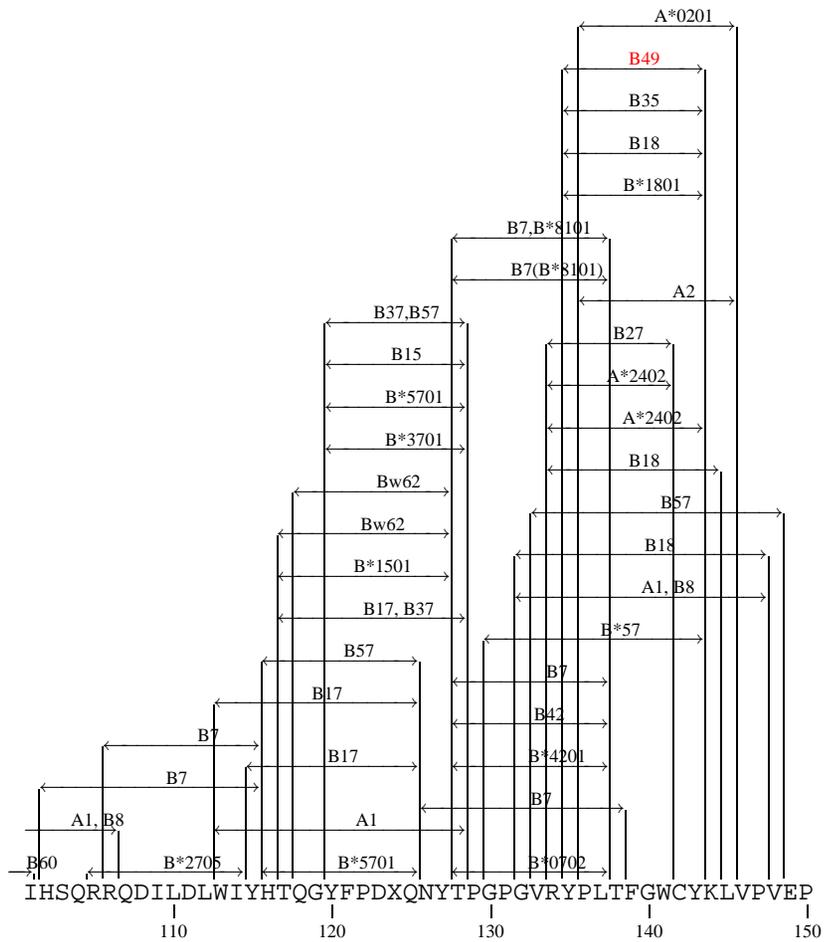
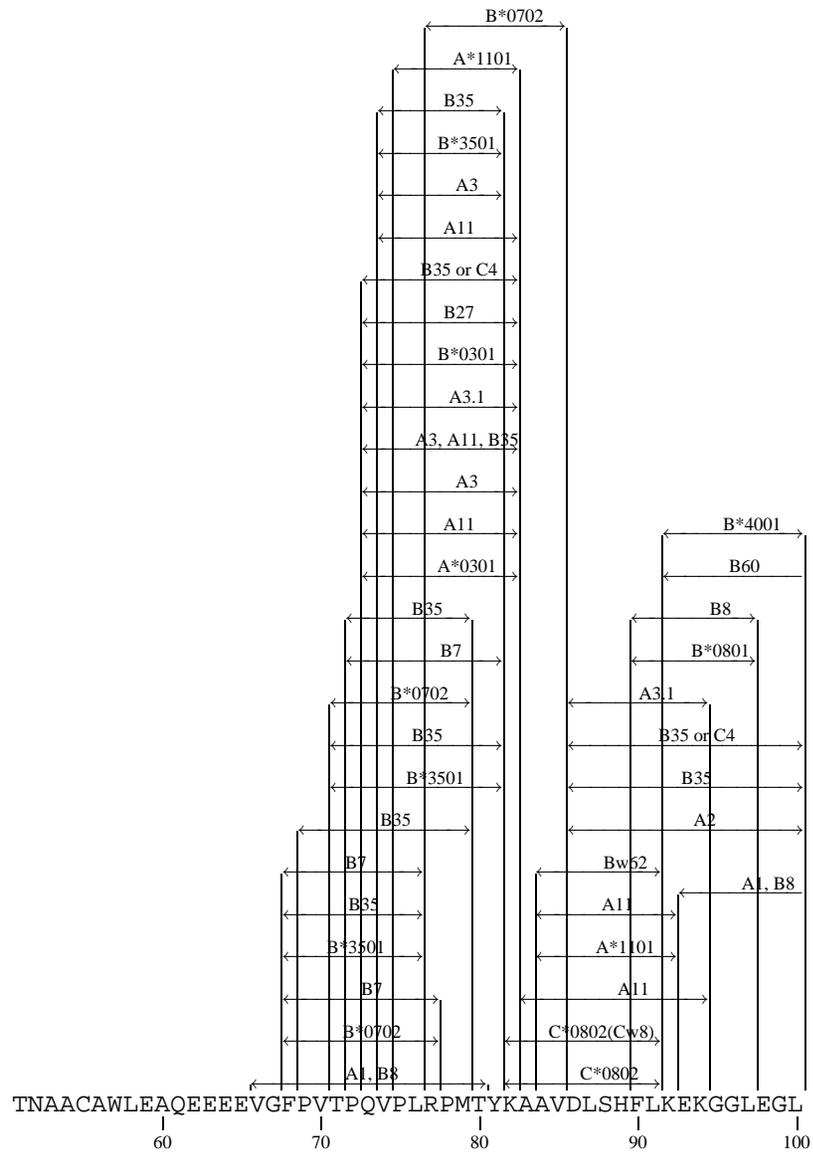


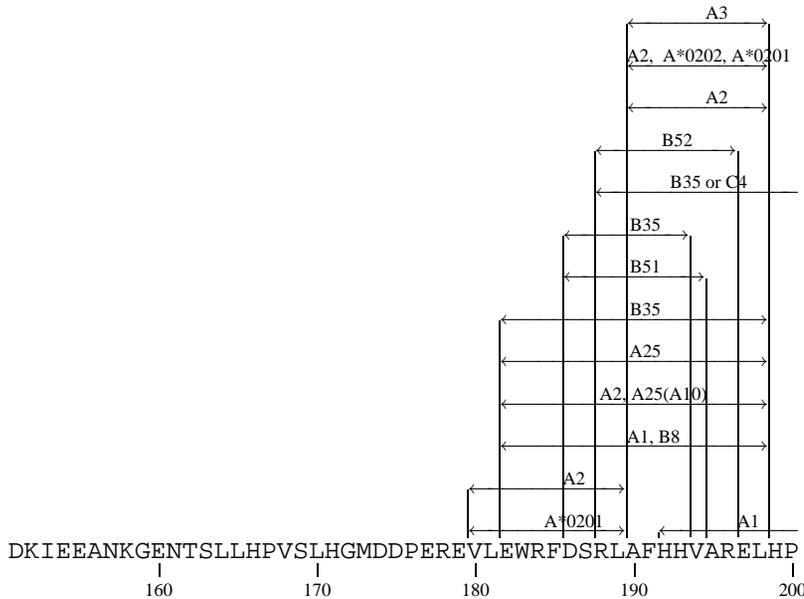
# Nef CTL Map



-> gp41 end







$\xrightarrow{A1}$   
 EYFKNC

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